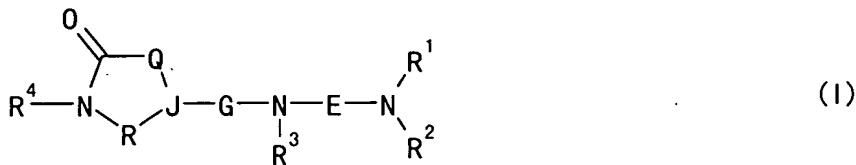


WHAT IS CLAIMED IS

1. A compound of the formula:



wherein

5 R^1 is a hydrocarbon group;

R^2 is a hydrocarbon group having 2 or more carbon
 atoms, or R^1 and R^2 may in combination form,
 together with an adjacent nitrogen atom, a ring
 optionally having a substituent or substituents;

10 R^3 is a hydrocarbon group optionally having a substituent
 or substituents or a heterocyclic group optionally
 having a substituent or substituents;

R^4 is a hydrogen atom, a hydrocarbon group optionally
 having a substituent or substituents or a heterocyclic
 group optionally having a substituent or substituents;

15 E is a divalent chain hydrocarbon group optionally having
 a substituent or substituents other than an oxo group;

 G is CO or SO_2 ;

 J is a nitrogen atom or a methine group optionally having
 a substituent or substituents; and

20 Q and R are each a bond or a divalent chain C_{1-3} hydrocarbon
 group optionally having a substituent or
 substituents,
 or a salt thereof.

25

2. The compound of claim 1, wherein R^1 is a C_{1-6} alkyl group
or a C_{3-8} cycloalkyl group; R^2 is a C_{2-6} alkyl group or a C_{3-8}
cycloalkyl group, or R^1 and R^2 in combination form, together
with an adjacent nitrogen atom, a ring optionally having a
30 substituent or substituents; R^3 is a C_{1-6} alkyl group

P
E
R
F
O
R
M
A
N
C
E

optionally having a substituent or substituents, a C₃₋₈ cycloalkyl group optionally having a substituent or substituents, an aryl group optionally having a substituent or substituents or a heterocyclic group optionally having a substituent or substituents; R⁴ is a hydrogen atom, alkyl group optionally having a substituent or substituents, a C₃₋₈ cycloalkyl group optionally having a substituent or substituents, an aryl group optionally having a substituent or substituents or a heterocyclic group optionally having a substituent or substituents; E is a C₂₋₅ alkylene group optionally having a substituent or substituents other than oxo group; G is CO or SO₂; J is a nitrogen atom or a methine group optionally having a substituent or substituents; and Q and R are each a bond or a C₁₋₃ alkylene group optionally having a substituent or substituents.

3. The compound of claim 1, wherein R¹ and R² in combination form, together with an adjacent nitrogen atom, a ring optionally having a substituent or substituents.

4. The compound of claim 3, wherein the ring optionally having a substituent or substituents is a 1-piperidinyl group or a 1-piperazinyl group each optionally having a substituent or substituents.

5. The compound of claim 4, wherein the substituent of the 1-piperidinyl group or 1-piperazinyl group is (1) phenyl-C₁₋₄ alkyl optionally having halogen on a benzene ring, (2) diphenylmethyl optionally having hydroxy, (3) benzoyl optionally having halogen on a benzene ring, (4) 2-phenylethen-1-yl, (5) phenyl optionally having halogen, (6) hydroxy, (7) phenoxy or (8) benzyloxy.

6. The compound of claim 3, wherein the ring optionally

having a substituent or substituents is a 1-piperidinyl group optionally having a substituent or substituents.

7. The compound of claim 6, wherein the substituent of the
5 1-piperidinyl group is a benzyl group optionally having halogen on a benzene ring.

8. The compound of claim 1, wherein R³ is (1) a C₁₋₆ alkyl group, (2) a C₃₋₈ cycloalkyl group, (3) a benzyl group
10 optionally having a hydroxy group, (4) a naphthylmethyl group, (5) a phenyl group optionally having, as a substituent, (a) C₁₋₄ alkyl optionally having halogen, (b) C₁₋₄ alkoxy optionally having halogen, (c) phenyl, (d) cyano, (e) benzyloxy or (f) a halogen atom, (6) a naphthyl group, (7) an
15 indanyl group or (8) a tetrahydronaphthyl group.

9. The compound of claim 1, wherein R³ is a phenyl group optionally having, as a substituent, C₁₋₄ alkyl or halogen.

20 10. The compound of claim 1, wherein E is C₂₋₆ polymethylene optionally having hydroxy.

11. The compound of claim 1, wherein R⁴ is (1) a hydrogen atom, (2) C₁₋₆ alkyl optionally having (a) halogen, (b)
25 pyridyl, (c) morpholino, (d) furyl, (e) ethynyl or (f) C₃₋₈ cycloalkyl, (3) phenyl-C₁₋₄ alkyl optionally having (a) halogen, (b) C₁₋₄ alkyl, (c) halogeno-C₁₋₄ alkyl or (d) C₁₋₄ alkoxy on a benzene ring, or (4) C₃₋₈ cycloalkyl.

30 12. The compound of claim 1, wherein R⁴ is (a) C₁₋₄ alkyl group optionally having, as a substituent, halogen or furyl or (b) a benzyl group optionally having halogen on a benzene ring.

13. The compound of claim 1, wherein $-N(R^1)R^2$ is a 1-piperidinyl group optionally having a substituent or substituents, E is a trimethylene group, R^3 is a phenyl group optionally having a substituent or substituents, G is CO, J is CH, and Q and R are each a methylene group.

14. A compound selected from the group consisting of N-[3-(4-benzyl-1-piperidinyl)propyl]-N-(3,4-dichlorophenyl)-1-methyl-5-oxo-3-pyrrolidinecarboxamide, 1-benzyl-N-[3-(4-benzyl-1-piperidinyl)propyl]-5-oxo-N-phenyl-3-pyrrolidinecarboxamide, 1-(2-chlorobenzyl)-N-[3-(4-benzyl-1-piperidinyl)propyl]-5-oxo-N-phenyl-3-pyrrolidinecarboxamide, N-[3-[4-(4-fluorobenzyl)-1-piperidinyl]propyl]-N-(3,4-dichlorophenyl)-1-methyl-5-oxo-3-pyrrolidinecarboxamide and N-[3-(4-benzyl-1-piperidinyl)propyl]-5-oxo-N-phenyl-1-(2,2,2-trifluoroethyl)-3-pyrrolidinecarboxamide, or a salt thereof.

15. A prodrug of the compound of claim 1.

16. A pharmaceutical composition containing the compound of claim 1 or a prodrug thereof and a pharmaceutically acceptable carrier, excipient or diluent.

17. The composition of claim 16, which is a chemokine receptor antagonist.

18. The composition of claim 16, which is a CCR5 antagonist.

19. The composition of claim 16, which is an agent for the prophylaxis or treatment of HIV infectious diseases.

20. The composition of claim 16, which is an agent for the prophylaxis or treatment of AIDS.

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21. The composition of claim 16, which is an agent for suppressing the progress of a disease state of AIDS.

5 22. The composition of claim 19, which further contains a protease inhibitor and/or a reverse transcriptase inhibitor in combination.

10 23. The composition of claim 22, wherein the reverse transcriptase inhibitor is zidovudine, didanosine, zalcitabine, lamivudine, stavudine, abacavir, nevirapine, delavirdine or efavirenz.

15 24. The composition of claim 22, wherein the protease inhibitor is saquinavir, ritonavir, indinavir, amprenavir or nelfinavir.

20 25. Use of the compound of claim 1 or a prodrug thereof, and a protease inhibitor and/or a reverse transcriptase inhibitor for the prophylaxis or treatment of HIV infectious diseases.

26. A method for producing a compound of the formula:

$$\begin{array}{c} \text{O} \\ \parallel \\ \text{R}^4-\text{N}-\text{R} \end{array} \text{---} \text{Q} \text{---} \text{J} \text{---} \text{G} \text{---} \begin{array}{c} \text{N} \\ | \\ \text{R}^3 \end{array} \text{---} \text{E} \text{---} \begin{array}{c} \text{N} \\ | \\ \text{R}^1 \end{array} \text{---} \text{R}^2 \quad (\text{I})$$

wherein

25 R¹ is a hydrocarbon group;

R² is a hydrocarbon group having 2 or more carbon atoms, or R¹ and R² may in combination form, together with an adjacent nitrogen atom, a ring optionally having a substituent or substituents;

30 R³ is a hydrocarbon group optionally having a substituent or substituents or a heterocyclic group optionally

having a substituent or substituents;
 R⁴ is a hydrogen atom, a hydrocarbon group optionally having a substituent or substituents or a heterocyclic group optionally having a substituent or substituents;
 5 E is a divalent chain hydrocarbon group optionally having a substituent or substituents other than an oxo group;
 G is CO or SO₂;
 J is a nitrogen atom or a methine group optionally having a substituent or substituents; and
 10 Q and R are each a bond or a divalent chain C₁₋₃ hydrocarbon group optionally having a substituent or substituents,
 or a salt thereof, which method comprises reacting a compound of the formula:

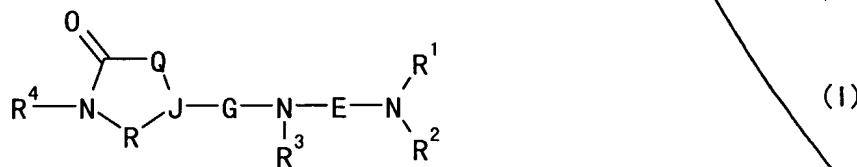


15 wherein each symbol is as defined above, or a salt thereof, and a compound of the formula:



wherein R⁵ is a carboxyl group or a sulfonic acid group, a
 20 salt thereof or a reactive derivative thereof, and other symbols are as defined above, or a salt thereof.

27. A method for producing a compound of the formula:



25 wherein

R¹ is a hydrocarbon group;

R²

is a hydrocarbon group having 2 or more carbon atoms, or R¹ and R² may in combination form, together with an adjacent nitrogen atom, a ring optionally having a substituent or substituents;

5 R³ is a hydrocarbon group optionally having a substituent or substituents or a heterocyclic group optionally having a substituent or substituents;

R⁴ is a hydrogen atom, a hydrocarbon group optionally having a substituent or substituents or a heterocyclic group optionally having a substituent or substituents;

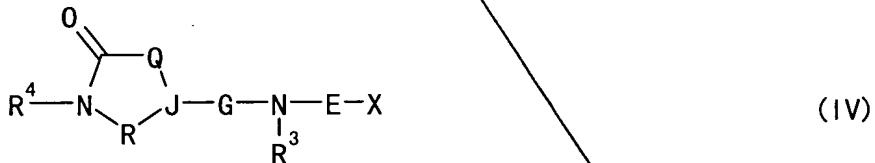
10 E is a divalent chain hydrocarbon group optionally having a substituent or substituents other than an oxo group;

G is CO or SO₂;

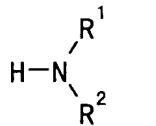
J is a nitrogen atom or a methine group optionally having a substituent or substituents; and

15 Q and R are each a bond or a divalent chain C₁₋₃ hydrocarbon group optionally having a substituent or substituents,

or a salt thereof, which method comprises reacting, in the presence of a base, a compound of the formula:



wherein X is a leaving group, and other symbols are as defined above, or a salt thereof and a compound of the formula:



25

wherein each symbol is as defined above, or a salt thereof.

28. A method for suppressing a chemokine receptor activity, which method comprises administering an effective amount of

the compound of claim 1 to a mammal.

29. Use of a compound of claim 1 for the production of a pharmaceutical agent that suppresses a chemokine receptor
5 activity.

30. The compound of claim 2, wherein R¹ and R² in combination form, together with an adjacent nitrogen atom, a ring optionally having a substituent or substituents.

10

31. The compound of claim 30, wherein the ring optionally having a substituent or substituents is a 1-piperidinyl group or a 1-piperazinyl group each optionally having a substituent or substituents.

15

32. The compound of claim 31, wherein the substituent of the 1-piperidinyl group or 1-piperazinyl group is (1) phenyl-C₁₋₄ alkyl optionally having halogen on a benzene ring, (2) diphenylmethyl optionally having hydroxy, (3) benzoyl
20 optionally having halogen on a benzene ring, (4) 2-phenylethen-1-yl, (5) phenyl optionally having halogen, (6) hydroxy, (7) phenoxy or (8) benzyloxy.

20

33. The compound of claim 30, wherein the ring optionally having a substituent or substituents is a 1-piperidinyl group optionally having a substituent or substituents.

25

34. The compound of claim 33, wherein the substituent of the 1-piperidinyl group is a benzyl group optionally having
30 halogen on a benzene ring.

30

35. The compound of claim 2, wherein R³ is (1) a C₁₋₆ alkyl group, (2) a C₃₋₈ cycloalkyl group, (3) a benzyl group optionally having a hydroxy group, (4) a naphthylmethyl

group, (5) a phenyl group optionally having, as a substituent, (a) C₁₋₄ alkyl optionally having halogen, (b) C₁₋₄ alkoxy optionally having halogen, (c) phenyl, (d) cyano, (e) benzyloxy or (f) a halogen atom, (6) a naphthyl group, (7) an indanyl group or (8) a tetrahydronaphthyl group.

36. The compound of claim 2, wherein R³ is a phenyl group optionally having, as a substituent, C₁₋₄ alkyl or halogen.

37. The compound of claim 2, wherein E is C₂₋₆ polymethylene optionally having hydroxy.

38. The compound of claim 2, wherein R⁴ is (1) a hydrogen atom, (2) C₁₋₆ alkyl optionally having (a) halogen, (b) pyridyl, (c) morpholino, (d) furyl, (e) ethynyl or (f) C₃₋₈ cycloalkyl, (3) phenyl-C₁₋₄ alkyl optionally having (a) halogen, (b) C₁₋₄ alkyl, (c) halogeno-C₁₋₄ alkyl or (d) C₁₋₄ alkoxy on a benzene ring, or (4) C₃₋₈ cycloalkyl.

39. The compound of claim 2, wherein R⁴ is (a) C₁₋₄ alkyl group optionally having, as a substituent, halogen or furyl or (b) a benzyl group optionally having halogen on a benzene ring.